



#33 1/2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION TO REISSUE
U.S. PAT. NO. 4,912,155,
ISSUED MARCH 27, 1990

SERIAL NO.07/714,441

FILED JUNE 13, 1991

FOR ANTIOXIDANT AROMATIC FLUORO-
PHOSPHITES

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: Art Unit: 1202
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: Examiner: Daus
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:

**SUPPLEMENTAL REISSUE PETITION,
DECLARATION AND POWER OF ATTORNEY**

I, Lester P.J. Burton, residing in New Castle County, State of Delaware, and citizen of Canada, hereby declare that:

1. I believe I am the original, first and sole inventor of the invention entitled ANTIOXIDANT AROMATIC FLUOROPHOSPHITES, described and claimed in the reissue application which was filed on June 13, 1991 and amended through January 14, 1994 and which was originally filed on February 27, 1987 as Application Serial No. 20,023, and which issued as U.S. Pat. No. 4,912,155 on March 27, 1990. Attached to this paper is an Attachment 1 showing a summary of all the amendment to the originally issued claims, and with all the matters in brackets deleted and underlined matter added, constitute the claims sought in this petition.

2. I have read and understand the contents of the above-identified specification, including the claims as amended by any amendments referred to above.

3. I hereby request that I may be allowed to surrender and do hereby assent to surrender the said U.S. Pat. No. 4,912,155, which is assigned in whole to my former employer, Ethyl Corporation, and request that the Patent may be reissued, upon the foregoing claims.

4. I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

5. I believe that the Patent may be wholly or partly inoperative or invalid by reason of my claiming more or less than I had a right to claim in the Patent; and that this was the result of error without any deceptive intention on the part of myself or my employer and assignee of the Patent. The errors relied upon are set forth in the paragraphs below, together with a specification of how and when the errors occurred.

6. I was unaware of any errors in the Patent until April 2, 1991, when I met with counsel, and certain errors were identified which are specified below. Other errors were disclosed to me during the course of the prosecution of this reissue application by way of the Examiner rejections.

Claim 1

7. I was assigned the task by my employer to discover new and useful antioxidants for organic materials, mainly polyolefin polymers, especially polypropylene. In the course of my work, I discovered aromatic fluorophosphites that were surprisingly good antioxidants and most surprisingly had far better hydrolytic stability than commercial antioxidants.

8. During the development of my invention, I had a librarian conduct a literature search to determine the state of the art. The search uncovered no indications that any aromatic fluorophosphites had ever been disclosed as antioxidants. Several aromatic fluorophosphite chemical structures had been disclosed in the prior art, but none of these were indicated to have

any utility to the best of my knowledge. I summarized my results in a memo that on October 8, 1986, I sent to Joseph Odenweller, the attorney then responsible for prosecuting my patent application. That memo was attached as Attachment A in the declaration I executed March 31, 1993.

9. I carefully reviewed the specifications and claims of the patent application which Mr. Odenweller prepared. However, in reviewing the claims, I failed to compare the claims against the prior art structures that I had previously uncovered. Having disclosed the structures to the attorney handling the patent application, I simply assumed that the attorney had taken the necessary steps in view of my invention and the prior art. I have limited knowledge of patent law, and relied on the attorney handling the prosecution to make certain that all patent law requirements were met.

10. I am now informed that Mr. Odenweller had apparently misunderstood my memo Attachment A. The memo summarized the results of an STN International computerized search. The results provide the structure, and, if the structure appeared only before 1967 there are "0 references" cited, but if the structured appeared in 1967 or after, references are cited. In my memo Attachment A, I had indicated for some structures that there were "0 ref", which meant as indicated above. I am informed that Mr. Odenweller understood that "0 ref" meant that the structure did not appear in the prior art. Unfortunately, I never discussed this memo with any attorney during the prosecution, and, therefore, never explained the import of my notations. Upon further review of the literature search results, I have also discovered that I overlooked and omitted in my memo certain aromatic fluorophosphite chemical structures that were in the computerized survey. I am now also informed that the attorney inadvertently failed to take into

account all the prior art chemical structures that I did supply to him. I believe that these inadvertent failures led to claim 1 of the Patent to potentially claim chemical compounds that were disclosed in the prior art.

11. I have now also been shown certain prior art of which I have no recollection of being aware at the time that my original patent application was filed. That art is stated in the Information Disclosure Statement that I understand was filed together with the original reissue petition.

12. More specifically, I verily believe that the original issued claim 1 may claim chemical compounds within Formulas V, VI, III or IV which were in the above prior art disclosures, and claim 1 should be further limited by deleting those Formulas V, VI, III and IV. In addition, with regard to claim 1 Formula IV, the Examiner rejected this part of the claim under §112 during his first Office Action of the reissue application. Formula IV was also cancelled in order to avoid this §112 rejection of the claim. I became aware of this problem only after the Examiner rejected this formula during the reissue application.

13. In claim 1, the Examiner also noted a typographical error in that "substituent" should have been "substituents". This error arose during the patent application of issued patent 4,912,155. The first time I was aware of the error was after the Examiner rejected the claim during the prosecution of the reissue application.

14. Further, with respect to claim 1, Formula II, the Examiner rejected the claim in view of §112 and requested that the first and second "aryl" be defined and "hydroxy" be deleted from the claim as unsupported in terms of how to make such compounds. I was not aware of these §112 defects in the claim until the Examiner brought them to my attention. The first "aryl" was

substituted with "phenyl" which is clearly supported by the specification and examples, and the second "aryl" was also defined as set forth in the specification. In the course of making the above corrections, it was brought to my attention that the punctuation should be corrected in that ":" should be ", ". I was not aware that my choice of the terms "aryl" or inclusion of hydroxy" would create §112 problems until the matter was brought to my attention after the filing of the original reissue application. I now see the errors, and wish to have them corrected.

Claims 2-4 and 6

15. With regard to claims 2 through 4 and 6 the claims had to be cancelled since they depended upon cancelled formulas in claim 1. The Examiner pointed out during the prosecution that the prior art discloses the compound of claim 2. Therefore, I believe that this claim should be cancelled. I became aware of this problem only after the Examiner rejected this formula during the reissue application.

16. Claims 3, 4 and 6, were not rejected over the prior art. These claims were allowable and rewritten in the independent format as claim 43.

Claim 8

17. Claim 8 was amended in view of U.S.S.R. Authorship Certificate 398,574. The amendment makes more clear that the antioxidants of the invention are added to the organic materials by mixing or spraying and are not substantially reacted with the organic materials, as is shown in the U.S.S.R. Authorship Certificate. I first became aware of the U.S.S.R. Authorship Certificate on April 2, 1991. I now recognize that the use of the term "containing" might potentially cause the claim to read on the reaction of antioxidant with the organic composition, which was not my intent. During prosecution of the reissue application, I also, first

became aware that the limitation that the said organic material be a "polymer of an olefinically unsaturated monomer" (the limitation of claim 10) was required to be inserted into claim 8 to avoid a possibility that the prior art (Baranauckus and Spivak) read on claim 8. The Examiner pointed out in the interview conducted on June 10, 1993 that the first two words of the claim "Organic material" should be changed to "A polymer of an olefinically unsaturated monomer". I was not aware of this change until after the Examiner pointed this error out. These changes were made per the Examiner's request.

Claim 9

18. Claim 9 was amended in view of §112 rejections made for the first time during the prosecution of said reissue application. Claim 9 Formulas I, II and III needed to be corrected for the same reason as stated in paragraph 14, above. The above paragraph 14 is here incorporated by reference. Claim 9 Formula IV was rejected by the Examiner because the specification did not sufficiently demonstrate how to make a compound with the "OH" substituents. I was not aware of that error until the Examiner's rejection was brought to my attention, but now recognize that Formula IV should be deleted. In addition the word "from" was misspelled as "rom". This error occurred during the printing of the patent. There was also another typographical error in that "R₃" should have been "R³" in the first line under Formula III. I first became aware of these errors during the prosecution of the reissue application.

Claim 10

19. Claim 10 had to be cancelled since claim 10 did not further limit amended claim 8. The limitation of claim 10 was inserted into claim 8. Therefore, this claim had to be cancelled.

Claim 11

20. Claim 11 has been amended to depend on newly added claim 44. Newly added claim 44 now restates what had been the "Formula II" portion of original claim 9. The error here is further explained in the discussion of the addition of claims 44 later in this paper. This amendment occurred during the prosecution of the reissue application. I first became aware of this error during the prosecution of the reissue application.

Claim 12

21. Claim 12 has been amended to depend directly from claim 9, and has been limited to a substituted "R" phenyl group. The errors arose as follows: first, it became apparent during the prosecution that there was no claim directly covering an organic composition with a Formula I compound with substituted phenyl groups, which is one of the preferred embodiments of my invention. Formula I with substituted phenyl groups in the R positions is reflected in the specification. The error of failing to make such composition a specific embodiment first became apparent during the prosecution of the reissue application. The claim had to be changed to be dependent directly on claim 9, rather than claim 11, because the previous limitation that the polymer be of an olefinically unsaturated monomer, which was originally contained in claims 10 and 11, was now incorporated into claim 9, and claim 11 was not made dependent on claim 44.

Claims 13 and 14

22. Claims 13 and 14 have been amended in order to obviate the §112 objections. The first time I became aware of the errors in these claims was during the prosecution of the reissue application. Further the "alkoxycarbonyl" substituents have been deleted to further differentiate

the claim from the previously cited Spivak '855 reference. This change was brought about during the prosecution of the reissue application.

Claims 17, 19 and 24

23. Claims 17, 19 and 24 have been amended to obviate the §112 rejection brought to my attention for the first time during the reissue prosecution after the Examiner rejected the claims. The error and the amendments to claim 19 are the same as shown in paragraph 14 above, and paragraph 14 is here incorporated by reference. Further, the word "atoms" was misspelled in the claim issued as "toms", which, I believe was a typographical error in the printing.

Claim 23 and 24

24. Typographical errors in claims 23 and 24 are corrected. The errors were not my fault, but arose in the printing of the original patent by the Patent and Trademark Office. Further, claim 24 contained the same errors as described in paragraph 14 above, and the same amendments were made that are described in paragraph 14. Above paragraph 14 is here incorporated by reference.

Claims 25-31, 41 and 42

25. Claims 25-31, 41 and 42 were rejected over the prior art for the first time during the prosecution of the reissue application. These claims were rejected October 7, 1991, on page 8 of the Office Action. This is the first time I became aware of the error related to these claims. To expedite prosecution, it was deemed preferable to concede these claims, as opposed to amending the claims to avoid the prior art cited by the Examiner.

Claim 43

26. Claim 43 was added to incorporate the dependent claims 3, 4 and 6 which had to be cancelled since they depended upon cancelled formulas in claim 1 into the independent format.

However, these claims were not rejected over the prior art. These claims were allowable and rewritten in the independent format as claim 43. The new claim 43 had to be added to save the otherwise valid claims 3, 4 and 6, which were defective only in that they were dependent from formulas of claim 1 which were over broad in view of the prior art. The error of claim is detailed in paragraphs 7 through 13, which are incorporated by reference.

Claim 44

27. Newly added claim 44 is essentially of the same scope as was original claim 19 and is of the same scope as the "Formula II" portion of claim 9. Claim 44 had to be added because of errors that occurred in claims 8 and 9, and which are detailed above in paragraphs 17 through 18, which are incorporated by reference. Because of the amendments which had to be made because of errors in claims 8 and 9, as detailed above, the invention of new claim 44, which was covered by the "Formula II" part of originally issued claim 9, was no longer covered by any claim. Therefore, claim 44 had to be added to save the invention which was clearly and specifically disclosed in the specification and which was covered by the originally issued claim 9, Formula II. The first time that it was recognized that claim 44 was needed was when the errors of claims 8 and 9 were disclosed by the Examiner during the present prosecution, and the original invention of claim 9, Formula II was found to be valid, allowable and no longer covered by the amended claims. Claim 44 does not have the additional limitation of the currently amended claim 8 -- i.e., limiting the "organic material normally susceptible to gradual oxidative degradation" to "being a polymer of an olefinically unsaturated monomer", because claim 8 is inclusive of other antioxidants of, for example, Formulas I and III, while claim 44 is limited to Formula II

antioxidants. The limitation had to be included in claim 8 in view of the prior art, but claim 44 is not subject to the same consideration.

CLAIMS 45-47

28. Newly added claims 45-47 were added in interference No. 103,217 against the Babillis patent (U.S. Patent No. 4,962,144) ("Babillis patent") assigned to General Electric Company ("GE") on January 18, 1994. Claim 45 further limits claim 44. Support for claim 45 can be found in the specification at column 14, lines 24-29 for the term "polycarbonate" and example 3 for "2,2'-ethylidenebis(4,6-di-t-butylphenyl)fluorophospite" (col. 18 lines 19-46). Support for newly added claims 46 and 47 can be found in the specification at col. 14, lines 49-54 and the original claims 32 through 42. Claims 45 to 47 were added to correspond to contingent count 2 in said interference. Claims 45 through 47 had to be added because of the interference in which GE alleged that its claims did not correspond to the count. Claims 45 through 47 were added to correspond to contingent Count 2 of the interference. The errors of not claiming 45-47 was not discovered until the interference. Because of the amendments which had to be made because of errors in the interference, as detailed above, the invention of new claims 45-47 were added. Therefore, claims 45-47 had to be added to save the invention which was clearly and specifically disclosed in the specification and which was covered by the originally issued claims 8 and 23. The first time that it was recognized that claims 45 through 47 were needed was during the interference when GE alleged that its invention was not covered by any of the claims.

CLAIMS 48-49

29. Newly added claims 48-49 were also added in interference No. 103,217. Support for newly added claim 48 can be found in the specification at column 14, lines 24-29 for the term

"polycarbonate" and example 3 for "2,2'-ethylidenebis(4,6-di-t-butylphenyl)fluorophospite" (col. 18 lines 19-46). Support for newly added claim 49 can be found in the specification at column 14, lines 49-54 and in the original issued claims 32 through 42. Claims 48 through 49 had to be added because of the interference in which GE alleged that its claims did not correspond to the count. Claims 48 through 49 were added to correspond to contingent Count 3 of the interference. The errors that occurred in not claiming claims 48-49 were not discovered until the interference with GE. The amendments had to be made because of errors in the interference, as detailed above, in paragraph no. 28 which is incorporated by reference. Therefore, claims 48-49 had to be added to save the invention which was clearly and specifically disclosed in the specification and which was covered by the originally issued claims 8 and 23. Again, the first time that it was recognized that claims 48 through 49 were needed was during the interference when GE alleged that its invention was not covered by any of my claims.

30. The specification contains corrections to typographical errors in the printed original patent, which errors were not my fault but arose in the printing by the Patent and Trademark Office.

31. At Cols. 15 and 16, I have also deleted the disclosure of the alternate use of PBr_3 in making an intermediate in the making of my invention. At the time I originally filed my application I believed that PBr_3 might be a useful reactant. I have since discovered that PBr_3 does not appear to work in the reaction.

32. A terminal disclaimer had to be filed in view of Patent No. 4,867,907 which issued prior to Patent No. 4,912,155 (the application involved in the reissue). Patent No. 4,912,155 has an earlier filing date. The Examiner pointed out during the prosecution of the reissue application

that double patenting existed. This was the first time I was aware of the double patenting rejection. A terminal disclaimer was filed in order to overcome this rejection.

33. As present advised and based on my best recollection, the material listed as offered for sale in the Babillis patent (US Patent No. 4,962,144) at column 3 line 5, was not offered for sale more than 1 year before the filing of the original application and in fact was offered for sale after the filing of the patent application of Patent No. 4,912,155.

34. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

35. I hereby appoint the following attorneys or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: Rudolf E. Hutz, Reg. No. 22,397; Thomas M. Meshbesh, Reg. No. 30,982; Robert G. McMorrow, Reg. No. 30,962; Ashley I. Pezzner, Reg. No. 35,646; Philip M. Pippenger, Reg. No. 25,525 and Richard L. Hansen, Reg. No. 27,338.

Address all telephone calls to Rudolf E. Hutz at telephone no. (302) 658-9141.

Address all correspondence to:

Rudolf E. Hutz
Connolly, Bove, Lodge & Hutz
1220 Market Building
P.O. Box 2207
Wilmington, Delaware 19899

Date: September 23, 1997



Lester P.J. Burton

Country of Citizenship: Canada

Residence: ~~2703 Tanager Road,~~
~~Wilmington, Delaware~~

55 LOCHVIEW DR
BEAR, DE 19701

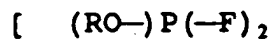
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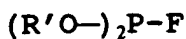
Attachment I

1. An aromatic fluorophosphorus compound suitable for use as an antioxidant
said compound being selected from fluorophosphorus compounds having the structure:



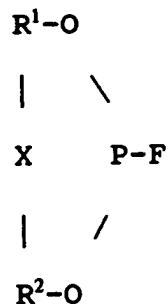
Formula V

wherein R is an substituted aryl group wherein the substituents are tert-alkyl groups:



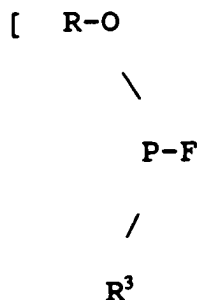
Formula VI

wherein R' is a substituted aryl group wherein the substituents are selected from sec-alkyl, tert-alkyl, aralkyl, cycloalkyl, hydroxy, alkoxy, aryloxy, halo, acyloxy, and alkoxy carbonyl alkyl:]



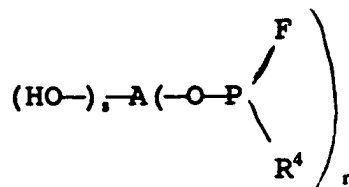
Formula II

wherein R¹ and R² are substituted or unsubstituted [aryl] phenyl groups wherein the [substituent] substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, [hydroxy,] alkoxy, aryloxy, and halo[:], and X is selected from the group consisting of a single bond connecting R¹ and R² and divalent bridging groups selected from divalent aliphatic hydrocarbon groups containing 1-12 carbon atoms, —O— and —S_q— wherein q is an integer from 1 to 3[:], and wherein aryl is selected from the group consisting of phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl and 4-sec-hexylphenyl.



Formula III

wherein R is a substituted or unsubstituted aryl group wherein the substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, hydroxy, alkoxy, aryloxy, halo, alkoxycarbonyl, alkoxycarbonyl-alkyl and acyloxy, and R³ is selected from the group consisting of alkyl, cycloalkyl, aralkyl, aryl, substituted aryl, alkoxy, cycloalkoxy and aralkoxy; and



Formula IV

wherein A is a mono- or poly-nuclear aromatic group, R⁴ is independently selected from fluorine, aryloxy, alkylaryloxy, alkoxy and polyalkoxy, r is an integer from 1 to 4, s is an integer from 0 to 3 and (r + s) equals the valence of A.]

[2. A compound of claim 1 namely bis(2,6-di-tertbutylphenyl) fluorophosphite.]

[3. A compound of claim 1 namely: bis(2,4-di-tertbutylphenyl) fluorophosphite.]

[4. A compound of claim 1 namely bis(4-octadecyloxycarbonylethyl-2,6-di-tert-butylphenyl) fluorophosphite.]

[6. A compound of claim 1 namely: bis-difluorophosphite ester) of 4,4'-methylenebis(2,6-di-tert-butylphenol).]

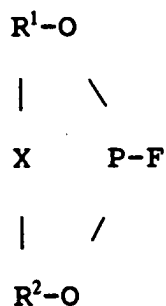
8. (Amended) [Organic material] A polymer of an olefinically unsaturated monomer normally susceptible to gradual oxidative degradation when in contact with oxygen, [said organic material] and having incorporated therein by mixing or spraying [containing] an antioxidant amount of an aromatic fluorophosphorus compound, said compound being characterized by having at least one benzene group bonded through oxygen to a trivalent phosphorus atom and at least one fluorine atom bonded to said phosphorus atom.

9. An organic composition of claim 8 wherein said fluorophosphorus compound is selected from the group consisting of compounds having the structures:



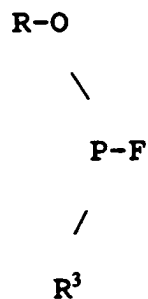
Formula I

wherein R is a substituted or unsubstituted [aryl] phenyl group wherein the substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, [hydroxy,] alkoxy, aryloxy, halo, alkoxycarbonyl, alkoxycarbonylalkyl and acyloxy and n is 1 or 2, and wherein aryl is selected from the group consisting of phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl and 4-sec-hexylphenyl;



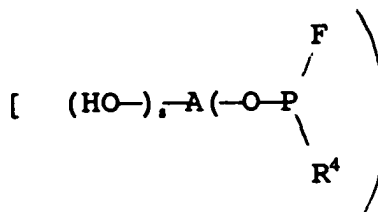
Formula II

wherein R^1 and R^2 are substituted or unsubstituted [aryl] phenyl groups wherein the substituents are selected from alkyl, aryl, aralkyl, cycloalkyl, [hydroxy,] alkoxy, aryloxy and halo, and X is selected [rom] from the group consisting of a single bond connecting R^1 and R^2 and divalent bridging groups selected from divalent aliphatic hydrocarbons containing 1-12 carbon atoms, —O— and —S_q— wherein q is an integer from 1 to 3[;], and wherein aryl is selected from the group consisting of phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl and 4-sec-hexylphenyl; and



Formula III

wherein R is as previously defined for Formula I and [R₃] R³ is selected from the group consisting of alkyl, cycloalkyl, aralkyl, aryl, substituted aryl, alkoxy, cycloalkoxy, aryloxy and aralkoxy[; and], and wherein aryl is selected from the group consisting of phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl and 4-sec-hexylphenyl.



Formula IV

wherein A is a mono or polynuclear aromatic group, R^4 is independently selected from fluorine, aryloxy, alkaryloxy, alkoxy and polyalkoxy and r is an integer from 1 to 4, s is an integer from 0 to 3 and (r+s) equals the valence of A].

[10. A composition of claim 8 wherein said organic material is a polymer of an olefinically unsaturated monomer.]

11. A composition of claim [9] 44 wherein said organic material is a polymer of an olefinically unsaturated monomer.

12. A composition of claim [11] 2 wherein said compound has Formula I[.] , and R is a substituted phenyl group.

13. A composition of claim 12 wherein n is 2 and said substituents are selected from alkyls having 1-20 carbon atoms, [aryls having 6-12 carbon atoms] phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl, 4-sec-hexylphenyl, aralkyls having 7-12 carbon atoms, cycloalkyls having 5-8 carbon atoms, [hydroxy,] alkoxy having 1-12 carbon atoms, aryloxy having 6-12 carbon atoms, halo, [alkoxycarbonylalkyl having 1-20 carbon atoms in its alkoxy moiety and 1-3 carbon atoms in its alkyl moiety, alkoxycarbonyl having 1-20 carbon atoms in its alkoxy moiety] and acyloxy having 1-4 carbon atoms.

14. A composition of claim 13 wherein said substituents are selected from alkyl having 1-20 carbon atoms [and alkoxy carbonylalkyl having 1-20 carbon atoms in its alkoxy moiety and 4 1-3 carbon atoms in its alkyl moiety].

17. A composition of claim [14] 12 wherein said fluorophosphite compound is bis(4-octadecyloxycarbonylethyl-2,6-di-tert-butylphenyl) fluorophosphite.

19. A composition of claim 9 wherein said fluorophosphite compound has Formula II wherein said substituents are selected from alkyl having 1-20 carbon atoms, [aryl having 6-12 carbon atoms,] phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl, 4-sec-hexylphenyl, aralkyl having 7-12 carbon atoms, cycloalkyl having 5-8 carbon atoms, [hydroxy,] alkoxy having 1-12 carbon [toms] atoms, aryloxy having 6-12 carbon atoms and halo, and X is selected from the group consisting of a single bond connecting R¹ and R² and divalent bridging groups selected from divalent aliphatic hydrocarbon groups containing 1-12 carbon atoms, -O- and -S_q- wherein q is an integer from 1-3.

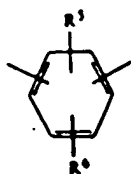
23. A composition of claim 20 wherein said fluorophosphite compound is [22,2,] 2,2'-bis(4,6-di-tert-butylphenyl) fluorophosphite.

24. A composition of claim 9 wherein said fluorophosphorus compound has Formula III wherein said substituents are selected from alkyls having 1-20 carbon atoms, [aryls

having 6-12 carbon atoms,] phenyl, o-tolyl, p-tolyl, naphthyl, 4-phenylphenyl, 4-sec-hexylphenyl, aralkyls having 7-12 carbon atoms, cycloalkyls having 5-8 carbon atoms, [hydroxy,] alkoxy having 1-12 carbon atoms, aryloxy having 6-12 carbon atoms, halo, alkoxycarbonylalkyl having 1-20 carbon atoms in its alkoxy moiety and 1-3 carbon atoms in its alkyl moiety, alkoxycarbonyl having 1-20 carbon atoms in its alkoxy moiety and acyloxy having 1-4 carbon atoms, and R^3 is selected from alkyl having 1-20 carbon atoms, cycloalkyl having 5-8 carbon atoms and aralkyls having 7-12 carbon atoms which are bonded through [oxyqen] oxygen to phosphorus and aryls having 6-12 carbon atoms, alkyl having 1-20 carbon atoms, cycloalkyls having 5-8 carbon atoms and aralkyls having 7-12 carbon atoms which are bonded directly to said phosphorus.

[25. A composition of claim 9 wherein said fluorophosphorus compound has Formula IV.]

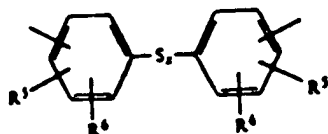
[26. A composition of claim 25 whrerein A has a structure selected from:



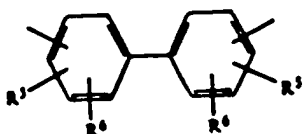
Structure IV (i)



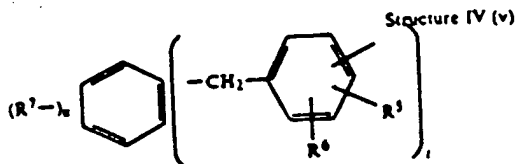
Structure IV (ii)



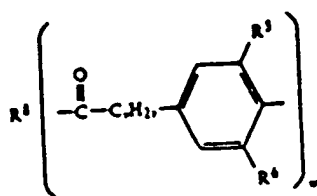
Structure IV (iii)



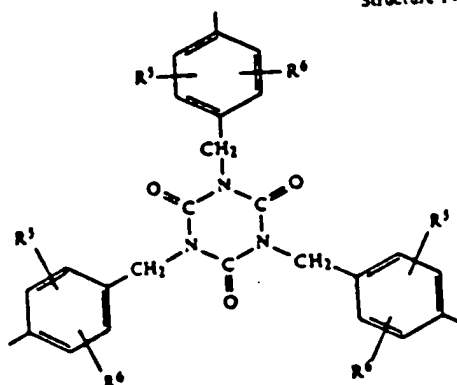
Structure IV (iv)



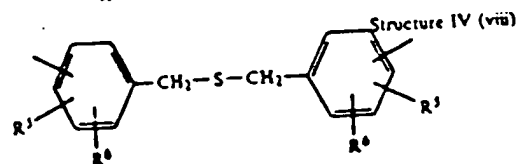
Structure IV (v)



Structure IV (vi)



Structure IV (vii)



Structure IV (viii)

wherein R^5 and R^6 are hydrogen or alkyl having 1-12 carbon atoms, y is an integer from 2 to 3, x is an integer from 1 to 3, t is an integer from 2 to 3, u is an integer from 0 to 4 ($t+u$) equals 2 to 6, w is an integer from 1 to 4, R^7 is hydrogen or an alkyl having 1 to 6 carbon atoms, R^8 is an aliphatic hydrocarbon radical having 1-30 carbon atoms and having valence w , v is an integer from 0-4, R^9 is an aliphatic hydrocarbon radical having 1 to 6 carbon atoms and having valence y .]

[27. A composition of claim 26 wherein said fluorophosphorus compound is 2,5-di-tert-butyl-1,4-phenylene bis (difluorophosphite).]

[28. A composition of claim 26 wherein said fluorophosphorus compound is 4,4'-methylenebis(2,6-di-tert-butylphenyl) bis(difluorophosphite).]

[29. A composition of claim 26 wherein said fluorophosphite compound is the tris(difluorophosphite ester) of 1,3,5-tris(3,5-di-tert-butyl-4-hydroxybenzyl)-2,4,6-trimethyl benzene.]

[30. A composition of claim 26 wherein said fluorophosphorus compound is the tetrakis(difluorophosphite ester) of tetrakis(methylene 3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate)methane.]

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[31. A composition if claim 26 wherein said fluorophosphite compound is difluorophosphite ester of octadecyl 3-(3,5,-di-tert-butylhydroxyphenyl)propionate.]

[41. An organic composition of claim 39 further characterized by containing about 0.005-5 wt. percent of a phenolic antioxidant.]

[42. An organic composition of claim 25 further characterized by containing about 0.005 -5 wt. percent of a phenolic antioxidant.]

--43. A aromatic fluorophosphorus compound suitable for use as an antioxidant, said compound being selected from the group consisting of bis(2,4-di-tert-butylphenyl) fluorophosphite; bis(4-octadecyloxycarbonyl-2,6-di-tert-butylphenyl) fluorophosphite; and 4,4'-methylenebis(2,6-di-tert-butylphenyl)bis (difluorophosphite).--

--44. A compound of claim 1 combined in an antioxidant amount with an organic material normally susceptible to gradual oxidative degradation when in contact with oxygen.--